

W. Va., on the 28th. Snow fell at Mount Washington, N. H., on the 23d, 24th, and 28th. The greatest depth of snowfall for the month, 17 inches, was reported at Blackfoot Agency, Mont.; 8.2 inches was reported at Climax, Colo.; 6.00 inches at Choteau, Mont.; and 2.00 inches at Fort Logan, Mont., and New England City and Steele, N. Dak.

Destructive storms were reported in Iowa and Wisconsin on the 1st; on Long Island, in West Virginia, Illinois, Iowa, South and North Dakota on the 5th; in West Virginia on the 6th; in West Virginia, Ohio, Illinois, and Texas on the 7th; in Pennsylvania on the 8th; in Indiana on the 9th; in New York on the 9-10th; near Eagle Pass, Tex., on the 10th; in Pennsylvania, New York, and Ohio on the 11th; in New York, West Virginia, and Arkansas on the 12th; in Maryland, New York, Pennsylvania, Ohio, and northern Michigan on the 13th;

in Florida and Texas on the 15th; on Long Island, in Rhode Island, southeastern Massachusetts, Pennsylvania, and Florida on the 16th; in New York, northern New Jersey, Connecticut, and Arizona on the 17th; in New Jersey, Iowa, and Florida on the 18th; in Georgia on the 21st; in Florida and Arkansas on the 22d; in Arkansas on the 23d; in Tennessee on the 24th; in North Carolina on the 25th; and in Florida on the 27th. Destructive floods occurred in central and western New York, central and western Pennsylvania, West Virginia, Ohio, Connecticut, and near Eagle Pass, Tex., from the 10th to the 15th. Drought prevailed in northern Missouri, east-central and southeastern Iowa, southeastern Kansas, southeastern South Dakota, and northwestern Oregon. Noteworthy auroral displays were reported at Fort Buford, N. Dak., on the 19th, and at Columbus, Ohio, on the 28th.

ATMOSPHERIC PRESSURE (expressed in inches and hundredths).

The distribution of mean atmospheric pressure for September, 1890, as determined from observations taken daily at 8 a. m. and 8 p. m. (75th meridian time), is shown on chart II by isobars. The departure of the mean pressure for September, 1890, obtained from observations taken twice daily at the hours named, from that determined from hourly observations, varied at the stations named below, as follows:

Station.	Departure.	Station.	Departure.
Eastport, Me.....	+ .007	Memphis, Tenn.....	+ .001
Boston, Mass.....	+ .010	Chicago, Ill.....	— .001
New York City.....	+ .012	Saint Louis, Mo.....	— .001
Philadelphia, Pa.....	+ .011	Saint Paul, Minn.....	— .001
Washington City.....	+ .014	Santa Fe, N. Mex.....	— .009
Savannah, Ga.....	+ .008	Denver, Colo.....	— .005
Buffalo, N. Y.....	+ .007	Fort Assiniboine, Mont.....	— .007
Detroit, Mich.....	+ .006	Salt Lake City, Utah.....	— .011
Cincinnati, Ohio.....	+ .006	San Francisco, Cal.....	— .015
Duluth, Minn.....	+ .003	San Diego, Cal.....	— .016

The mean pressure was highest from the upper Mississippi valley eastward to the Atlantic coast between the 33d and 45th parallels, where it was above 30.10, the highest mean value, 30.15, being noted at stations in the west part of the lower lake region, and on the south New England and middle Atlantic coasts. The mean pressure was lowest over the west part of the southern plateau region, where it was below 29.85, the lowest mean value, 29.80, being noted at Yuma, Ariz. From the middle and southeast slopes of the Rocky Mountains northeastward over the upper lake region and south of east to the south Atlantic coast, and on the Pacific coast north of the Columbia River the mean pressure was above 30.05, and from the northern plateau region southwestward over the Pacific coast, southward over the middle and southern plateau regions, and southeastward over the Rio Grande Valley, and on the northeast slope of the Rocky Mountains and thence northward over the British Possessions the mean pressure was below 30.00.

A comparison of the pressure chart for September with that of the preceding month shows that there was an increase in mean pressure, save along the immediate Pacific coast, over the southwest part of the southern plateau region, and from Tennessee southeastward over the south Atlantic coast and Florida, southward over the east Gulf states, and southwestward over the west Gulf coast. The greatest increase in mean pressure occurred from the Saint Lawrence Valley and the east part of the lower lake region southward to the Atlantic coast between the 40th and 45th parallels, where it exceeded .10, and the increase in mean pressure exceeded .05 over the entire country north of the 40th parallel and east of the northern plateau region. In districts where the mean pressure was lower than for the preceding month the decrease was less than .05. A general comparison of the September chart with that of the preceding month shows that the area of high pressure central over the south Atlantic states in August greatly extended its limits, with included values

about the same; that the mean pressure along the north Pacific coast remained about the same; that there was an increase in mean pressure of more than .05 in the upper Missouri valley and the British Possessions to the northward; and that slight changes occurred in the area of low pressure central over the west part of the southern plateau region.

The mean pressure was above the normal, save within an area extending from eastern Tennessee and western Georgia westward to east-central Texas, and from the central part of the northern plateau region southward over the Pacific coast to the 35th parallel. The greatest departures above the normal pressure occurred from the Atlantic coast north of the 40th parallel westward to the Missouri valley, and in the British Possessions north of North Dakota and Montana, where they exceeded .05. In districts where the mean pressure was below normal the departures were less than .05.

The monthly barometric ranges at regular stations of the Signal Service are shown in the table of Signal Service data on the last two pages of the REVIEW.

AREAS OF HIGH PRESSURE.

Eight areas of high pressure were observed within the limits of stations of observation during the month of September. The general course of movement of these areas was to the southeast while passing over the eastern half of the United States, while those observed farther to the westward moved generally to the southeast until the centre reached the 40th parallel, after which the movement was to the eastward over the Lake region. Three areas were observed on the Pacific coast, two of which were traced eastward to the Atlantic, while the third disappeared after reaching the middle plateau region. The usual tendency of areas of high pressure on the Pacific coast to move to the north of east while approaching the coast and to the south of east after passing to the east of the coast line obtained during the month of September. The mean latitude of the tracks of the areas of high pressure during September was to the north of the normal track for that month, and they were most frequently observed over the east portions of the Lake region and the upper Saint Lawrence valley, six of the areas having reached the coast north of Hatteras, N. C.

The following is a general description of the weather conditions observed during the transit of each area of high pressure over the region of observation:

I.—The month opened with a well-defined area of high pressure covering the eastern portion of the United States and central over the upper Ohio valley, and a second area of high pressure covering the region far to the north of North Dakota. The trough of low pressure extending from Lake Superior southwestward separated these areas of high pressure on the 1st, but the succeeding reports showed a rapid increase of pressure over the north portion of the Lake region, apparently forcing the barometric trough to the westward, and resulting

in a union of the two areas of high pressure on the Atlantic coast on the evening of the 2d, where it remained until the 5th, attended by generally fair weather over the greater portion of the region east of the Mississippi, except in the east Gulf and the southern portion of the south Atlantic states, where the northeasterly winds attending this high area were accompanied by general rains. The pressure decreased on the Atlantic coast during the 4th and 5th, and there was an apparent tendency of the area of high pressure to move westward over North Carolina during the 6th and 7th, although it is probable that the principal portion of this area moved south-eastward over the Atlantic.

II.—Appeared on the north Pacific coast on the 1st, and after moving northeastward over Oregon and Washington it passed southeastward to the central plateau region, where it disappeared by gradual decrease of pressure without causing any marked change in the weather conditions over the regions where it was observed.

III.—Although this area of high pressure could not be directly traced to the Pacific coast, reports indicate that it had its origin to the westward of the coast line. It was first observed in British Columbia on the 5th, after which it moved almost directly southward over the Rocky Mountain states to eastern Utah, where it was central on the 7th, covering the greater portion of the United States west of the Mississippi, attended by frosts at Rocky Mountain stations as far south as Colorado. From the Rocky Mountain regions it moved rapidly eastward, extending over the central valleys on the morning of the 8th and the Lake region and Saint Lawrence Valley on the 9th. The first killing frosts occurred at Moorhead on the 8th, and light frosts were reported from northwest Iowa and eastern Nebraska on the same date. The easterly course of this area continued during the 10th, 11th, and 12th, passing over the Saint Lawrence Valley, northern New England, and Nova Scotia, the centre of greatest pressure approximately following the 45th parallel, causing the winds to shift to the eastward over the eastern portions of the United States, and these easterly winds were attended by general rains, although no marked barometric depression developed until the 12th, when a storm of considerable energy was central in the upper lake region.

IV.—Was first observed north of Alberta, N. W. T., on the 8th, where it remained almost stationary until the 10th, an area of low pressure covering the northern Rocky Mountain districts and plateau regions from the 8th to the 10th, and this condition was followed by a flow of cold air from the north over the Rocky Mountain regions, attended by freezing weather and snow during the 11th in the upper Missouri valley, Montana, Wyoming, Minnesota, and the Dakotas. This area moved southeastward over the Missouri Valley, it being central in Montana on the 12th and in Missouri on the 13th, and killing frosts were reported from Iowa and Nebraska, and light frosts from Missouri and Kansas. After reaching Missouri the course changed to the north of east, and the centre of greatest pressure followed the general course of the Ohio Valley, and thence over Pennsylvania, New York, and the south New England coast. Its movement east of the Mississippi was marked by frosts over the states north of the Ohio River, but owing to continued cloudiness and rain in the states on the Atlantic coast the frosts did not extend eastward as far as the middle Atlantic states. This area passed to the eastward of New England during the 14th, and was last observed as central to the southeast of Nova Scotia on the 15th.

V.—This area of high pressure had its origin within the limit of stations of observation. It apparently formed over the Northwest on the 15th, being central in Minnesota on the afternoon of that date. It moved directly southeast, attended by light frosts in the upper lake region on the 16th and 17th, after which it extended southward over the central valleys and Southern States, the centre reaching West Virginia on the 18th and the North Carolina coast on the 19th, from which point it apparently continued its southeasterly course.

VI.—Was observed off the north Pacific coast on the 17th, and passed eastward over British Columbia during the succeeding twenty-four hours. The course changed to the south-eastward and it crossed the Rocky Mountains, covering the territory from the Dakotas southward to Texas on the morning of the 19th, when the centre was in western Kansas where the temperature was below freezing. After reaching the eastern slope of the Rocky Mountains the course changed to easterly and it passed over the upper Mississippi valley and the Lake region during the 20th and over the middle Atlantic states during the 21st, the course changing again to the southeast as the centre approached the coast. Killing frosts occurred in Wisconsin near the centre of this area the 20th and light frosts occurred in the lower lake region the 21st. It was last observed as central off the middle Atlantic coast on the 22d.

VII.—This area was also first observed on the north Pacific coast, the afternoon report of the 19th indicating that it was central to the west of Washington. It passed to the east of the coast line during the 20th, and on the morning of the 22d it covered the upper Missouri valley and the northern Rocky Mountain districts. It apparently moved southward during the night of the 21st, covering the greater portion of the territory between the Rocky Mountains and the Mississippi Valley, while a storm of considerable energy was developing on the west Gulf coast and a second disturbance was central north of Lake Superior. The a. m. report of the 23d showed an advance northward of the west Gulf storm, and, while the barometric pressure remained high on the eastern slope, the centre of greatest pressure had been transferred from Kansas to Manitoba, where the area of high pressure was well defined and the barometer about one-tenth of an inch higher than it was at the centre on the previous day. Although the disturbance in the lower Mississippi valley was about ten degrees to the eastward of the area of high pressure the latter moved with greater velocity and passed southeastward north of the Lake region and over the upper Saint Lawrence valley and New England during the 24th and 25th, apparently forcing the area of low pressure above referred to to remain in the lower Mississippi valley, where it remained almost stationary until the 25th, losing energy, and it finally became an extended barometric trough covering the central valleys and the Lake region. After reaching the south New England coast on the 25th the pressure decreased rapidly, and it was followed in that region by a coast storm of considerable energy on the following day.

VIII.—Was observed to the north of Manitoba on the 26th, after which it moved directly southward to the upper lake region, attended by strong northeasterly gales on Lake Superior and light frosts in the upper lake region. It was central north of Lake Superior on the morning of the 27th, and in northern Michigan on the morning of the 28th, when killing frosts were reported generally throughout Iowa, Minnesota, and Wisconsin, and light frosts in the states of the Ohio Valley. This area of high pressure was attended by the maximum barometric pressure observed during the month at many stations in the Lake region and the Northwest. It extended from the Atlantic to the Pacific coasts, and caused killing frosts in northern Kansas on the 29th. General frosts were also reported from the interior of New England and the middle Atlantic states on the 29th and 30th, the area of high pressure remaining central in the lower lake region at the close of the month.

AREAS OF LOW PRESSURE.

Seven areas of low pressure were observed during the month of September, only two of which reached the Atlantic coast within the limits of the United States. An examination of chart I, exhibiting the tracks of the areas of low pressure, will show that the meteorology of the month was remarkable for the fact that no well-defined storm was traced across the Mississippi Valley during the month, and the two depressions traced over the Lake region were feeble and their centres could be only approximately located while the disturbances were passing over

the continent. The absence of tropical storms during September will also be noted, and, as in the preceding month, the depressions observed were in no case traced to the west of the Rocky Mountains.

Tabulated statement showing principal characteristics of areas of high and low pressure.

Barometer.	First observed.			Last observed.		Duration.	Velocity per hour.	Maximum pressure change and maximum abnormal temperature change in twelve hours and maximum wind velocity.													
	Date.	Lat. N.	Long. W.	Lat. N.	Long. W.			Station.	Rise.	Date.	Station.	Fall.	Date.	Station.	Direction.	Miles per hour.	Date.				
High areas.		°	°	°	°	Days.	Miles.		Inch.				°								
I.....	1	55	107	33	73	4.0	30	Winnipeg, Man.....	.42	1	Huron, S. Dak.....	22	1	Anticosti Island, G. St. L.	w.	40	2				
II.....	2	47	127	42	113	2.0	25	Fort Washakie, Wyo.....	.24	3	Salt Lake City, Utah.....	14	3	Fort McKinney, Wyo.....	nw.	42	3				
III.....	5	52	119	42	59	7.5	23	Denver, Colo.....	.46	6	do.....	38	6	do.....	nw.	48	6				
IV.....	8	57	120	40	69	6.0	23	Omaha, Nebr.....	.48	7	Saint Paul, Minn.....	30	12	Fort Elliott, Tex.....	n.	48	12				
V.....	15	48	97	35	77	3.5	20	Rawlins, Wyo.....	.36	16	Kansas City, Mo.....	18	16	Chicago, Ill.....	ne.	36	16				
VI.....	17	47	130	36	73	5.0	34	Dubuque, Iowa.....	.56	18	Davenport, Iowa.....	26	19	Fort Elliott, Tex.....	n.	48	19				
VII.....	19	48	120	40	70	6.0	28	Medicine Hat, N. W. T.....	.42	20	Pueblo, Colo.....	24	20	Fort McKinney, Wyo.....	nw.	48	20				
VIII.....	26	55	96	43	79	4.5	12	do.....	.42	20	Cincinnati, Ohio.....	16	27	Chicago, Ill.....	ne.	46	27				
Mean.....						4.8	24	Port Arthur, Ont.....	.41			24				44					
Low areas.									Fall.			Rise.									
I.....	1	45	108	52	94	3.0	23	Port Arthur, Ont.....	.26	3	Qu'Appelle, N. W. T.....	19	3	Fort McKinney, Wyo.....	sw.	36	2				
II.....	4	50	109	51	88	2.5	20	Helena, Mont.....	.34	4	Fort Custer, Mont.....	18	4	Dodge City, Kans.....	s.	42	6				
III.....	10	45	104	52	84	2.5	20	Port Arthur, Ont.....	.30	12	Fort Sully, S. Dak.....	17	10	Chicago, Ill.....	nw.	40	12				
IV.....	16	40	75	48	62	2.0	21	Chatham, N. B.....	.22	18	Kansas City, Mo.....	12	14	Northfield, Vt.....	ne.	30	18				
V.....	15	53	115	48	77	4.0	23	Fort Sully, S. Dak.....	.36	16	Fort Sully, S. Dak.....	25	16	Chicago, Ill.....	w.	48	19				
VI.....	19	52	112	51	86	2.0	26	Huron, S. Dak.....	.42	19	Fort Custer, Mont.....	22	19	Fort Assiniboine, Mont.....	nw.	36	19				
VI a.....	19	52	104	34	88	6.0	20	Qu'Appelle, N. W. T.....	.24	20	Pueblo, Colo.....	14	20	El Paso, Tex.....	ne.	46	20				
VII.....	25	40	88	47	54	2.0	46	Fort Sill, Ind. T.....	.32	27	Alpena, Mich.....	13	25	Block Island, R. I.....	se.	36	27				
VII.....	27	57	117	51	106	3.0	8	Sydney, C. B. I.....	.32	27	Swift Current, N. W. T.....	20	30	Swift Current, N. W. T.....	sw.	32	29				
Mean.....						3.0	24	Medicine Hat, N. W. T.....	.31			18				38					

The following is a general description of the weather conditions attending the movements of each area of low pressure:

I and II.—On the morning of the 1st this disturbance was central over Wyoming, but during the day it separated, one portion remaining west of the Rocky Mountains, while a secondary disturbance passed over western Nebraska. It remained central in Nebraska until the afternoon of the 3d, when it passed northeastward to the vicinity of Lake Superior. The centre of this disturbance was approximately located on the 4th to the northeast of Winnipeg, Man., but its subsequent course could not be accurately determined, owing to the absence of reports from the regions north of Minnesota and North Dakota. This disturbance was followed by the development of a second depression north of Montana which has been traced as number 11, although it may possibly form a part of the original disturbance. This last depression, after passing southward to the northern portion of Wyoming on the 5th, moved eastward to the Dakotas and northern Minnesota during the 5th and 6th, developing considerable energy and being attended by high southerly winds in the east quadrants and still stronger northerly winds in the west quadrants after the storm-centre had passed to the eastward. Secondary disturbances also developed in the central Rocky Mountain regions and in the lower Missouri valley, which were quickly replaced by the area of high pressure which covered the eastern slope of the Rocky Mountains after the passage of this storm to the region north of Lake Superior, where it disappeared on the 7th. The disturbances numbers I and II had but slight effect upon the weather conditions east of the Mississippi, and both disappeared to the north of Lake Superior.

III.—This disturbance formed in the upper Missouri valley and over Montana on the 10th, although the pressure was decidedly below the normal during the preceding forty-eight hours in the plateau regions, the barometer being lowest in western Arizona. An area of high pressure to the northwest forced this disturbance to the southeastward and afterwards to the eastward, a secondary disturbance forming over Kansas on the 11th which, apparently under the influence of the high area above referred to, moved southeastward to Texas where it disappeared by increase of pressure before reaching the Mississippi Valley. The primary disturbance moved eastward over Minnesota during the 11th and thence northeastward over Lake Superior on the 12th, apparently reaching its

maximum energy whilst central near the northern portion of Lake Superior. The track of this disturbance was not given on chart I after the morning of the 13th, but the pressure diminished rapidly at stations in the lower Saint Lawrence valley, and the succeeding reports indicate that it passed northeastward beyond the limits of observation, leaving a secondary disturbance of slight energy central over the upper lake region. Severe westerly gales occurred in the Lake region while this disturbance was moving eastward north of Lake Superior, and high southwesterly winds occurred on the New England and middle Atlantic coasts on the 13th, when the disturbance was probably to the north of the lower Saint Lawrence valley.

IV.—This disturbance probably had its origin in the extended low area which covered the Mississippi Valley and Lake region on the 15th, although it was first located as central near the New Jersey coast on the afternoon of the 16th. The extension of the storm track to the westward is given to indicate the previous movement of the feeble disturbance which preceded the development of this storm. The a. m. report of the 17th indicated that this storm had passed off the coast and that it was central southeast of New England, where it changed direction to the northward, reaching the coast of Maine on the morning of the 18th, and disappearing to the northeast of the Maritime Provinces by the morning of the 19th.

V.—This disturbance was observed north of Montana on the 16th, and moved directly to Manitoba, where it was central on the morning of the 17th, the barometer being low over the eastern slope of the Rocky Mountains as far south as northern Texas. The p. m. reports of the 17th indicated that the centre of lowest pressure had shifted southward to South Dakota, from which point it moved eastward with increasing energy, attended by very heavy rains generally throughout the Northwest. The centre of disturbance passed over the northern portion of the Lake region, the storm apparently reaching its maximum energy while central near the east extremity of Lake Superior, where the barometric pressure was 29.50 on the morning of the 19th. Strong westerly gales occurred in the Lake region on the 19th and 20th, but they did not extend eastward to the Atlantic coast, probably owing to the fact that the barometric pressure was increasing at the centre after the centre passed east of the upper lake region. The course of this storm also carried the centre so far to the north as to render it impossible to locate its track after the 19th.

VI.—This storm apparently had its origin to the north of Montana on the 19th. It moved eastward as an extended depression, covering the Rocky Mountain regions, two depressions forming in the barometric trough which covered the eastern slope of the Rocky Mountains on the 20th. The more northerly of these depressions, which was central over Manitoba on the 20th, developed but slight energy and could not be traced farther eastward than Lake Superior, where it was approximately located on the 21st. The southern disturbance first observed over western Nebraska moved directly southward to southern Texas during the 20th and 21st, after which it apparently moved to the east of the coast line and changed direction to the northeast, moving very slowly over Louisiana and Mississippi from the 22d to the 25th, developing but slight

energy, but attended by heavy rains generally throughout the Southern States. The rain area extended northward over the Lake region and middle Atlantic states on the 25th, when a secondary disturbance formed over Illinois in the northern extremity of the barometric trough which attended this disturbance. This secondary disturbance passed eastward over the lower lake region and thence to the middle Atlantic coast, where it was central the afternoon of the 26th, and the succeeding report indicates that this storm increased in energy and moved northeastward along the Nova Scotia coast during the 27th.

VII.—At the close of the month this depression was central north of North Dakota, though the previous reports indicate that it existed in the region far to the north of Montana as early as the 27th.

NORTH ATLANTIC STORMS FOR SEPTEMBER, 1890 (pressure in inches and millimetres; wind-force by Beaufort scale).

The paths of the storms that appeared over the north Atlantic ocean during September, 1890, are shown on chart I. These paths have been determined from international observations by captains of ocean steamships and sailing vessels received through the co-operation of the Hydrographic Office, Navy Department, and the "New York Herald Weather Service."

Seven storms have been traced for September, 1890, the average number for the corresponding month of the last 7 years being 9. Of the storms traced for the current month 3 were continuations of low pressure areas which first appeared over the North American continent; one was a continuation of a West India cyclone which advanced from east of the Windward Islands to west of Bermuda and thence northeastward to the Banks of Newfoundland during the last 5 days of August; two apparently developed over mid-ocean; and one first appeared southwest of the British Isles. The storms generally pursued normal east to northeast paths, and no storm traversed the ocean from coast to coast.

The month opened with the West India cyclone referred to central off the southeast extremity of Newfoundland, with pressure about 29.00 (737) and gales of hurricane force. By the 2d this storm had advanced to off the southern extremity of Greenland, after which it disappeared over mid-ocean in high latitudes. On the 4th, at 1.30 p. m., a telegram was received from Havana, Cuba, stating that a cyclonic disturbance was south of that place, moving westward. At 3 p. m., 5th, a telegram from Havana stated that a cyclonic disturbance was south of that station, and on the 6th, at 8.45 a. m., stating that a disturbance to the southwest was crossing Yucatan and probably moving w. by n. On the 7th a storm, which was a continuation of a low pressure area which moved eastward over the Gulf of Saint Lawrence, was central on the east edge of the Banks of Newfoundland, where it remained nearly stationary until the 10th, after which it passed northeastward and disappeared in the direction of Iceland after the 12th, attended during the 11th and 12th by fresh to strong gales. From the 8th to 10th the advance of this storm was apparently checked by high pressure to the eastward. On the 12th, at 1.47 p. m., a telegram was received from Havana stating that the upper currents gave some indication of a cyclone to the northeast. On the 14th the barometer was below 29.60 (752) over mid-ocean in high latitudes. During the 15th and 16th the pressure was about 29.00 (737) wnw. of Ireland, and the pressure continued low in that region during the 17th. On the 16th a storm was central on the south New England coast, where it continued nearly stationary during the 17th, its advance being apparently checked by high pressure to the eastward, and during the 18th and 19th it advanced northeastward over the Gulf of Saint Lawrence and disappeared north of Newfoundland. On the 18th the barometer was high over mid-ocean in high latitudes, and a storm was apparently developing between the 30th and 40th parallels. On the 19th a storm was central southwest of Ireland, with pressure below 29.40 (747) and fresh

gales, whence it moved slowly east of north and disappeared north of the British Isles during the 22d, attended by heavy gales and pressure falling below 29.00 (737) on the 20th. On the 21st a storm was central over the Gulf of Saint Lawrence, whence it apparently moved rapidly northeastward over Newfoundland and disappeared north of the region of observation near the 20th meridian after the 24th, with strong gales and pressure below 29.30 (744) on the 23d. During the 23d a storm moved eastward over the Canadian Maritime Provinces and on the 24th was central off the east coast of Newfoundland, with pressure below 29.70 (754) and strong gales, after which it moved northeast beyond the region of observation. On the 27th a storm of considerable strength moved eastward over Nova Scotia, and on the 28th a storm of moderate energy was central east of Nova Scotia. During the 29th and 30th a storm advanced eastward over mid-ocean in high latitudes and disappeared north of the British Isles. On the 30th a storm of marked energy, with pressure below 29.40 (747), at noon, Greenwich time, and heavy gales, was central over the Banks of Newfoundland.

Well-defined and destructive September cyclones have averaged about one per year over the West Indies, their usual path being westward from or near the Windward Islands to the Gulf of Mexico, where they recurve northward. Among notable West India cyclones charted and described in the REVIEW are: 1882, storm appeared north of San Domingo on the 2d and moved westward over Cuba to the central Gulf, where it recurved to the Alabama coast by the night of the 9th, following the usual parabolic path. 1883, storm moved from off the eastern extremity of Cuba on the 6th northwestward over the Bahamas to the North Carolina coast by the 11th. 1886, storm off the west Gulf coast moved northward to the middle Texas coast from the 22d to 24th. 1887, one storm advanced from east of the Windward Islands on the 11th westward over the Caribbean Sea and north of west over the Gulf of Mexico to the Texas coast by the 21st, and one moved northeast from the western extremity of Cuba over the Bahamas. 1888, one storm moved from north of Puerto Rico on the 1st westward over Cuba and Yucatan to the Mexican coast near Vera Cruz by the 7th, a very unusual course, and one passed from the Bahamas westward over southern Florida, where it recurved northward during the 8th and 9th. 1889, a storm advanced from the Windward Islands to the middle Atlantic coast from the 3d to 12th; a storm moved westward over the Caribbean Sea from the 13th to 17th, and thence apparently passed over Yucatan and recurved to the north-central coast of the Gulf of Mexico by the 22d; a storm northeast of the Windward Islands on the 4th and 5th recurved northeast and disappeared north of the Azores after the 11th.

FOG IN SEPTEMBER.

The limits of fog-belts west of the 40th meridian, as determined from reports of shipmasters, are shown on chart I by